

## ABSTRACT

Characterisation and Ecology of the Bon Accord Lagoon,  
Tobago, West Indies

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Bon Accord Lagoon is a mangrove-fringed lagoon with a seagrass community, found landward of the Buccoo Reef. Buccoo Reef is a major tourist attraction with great economic and cultural significance. Previous studies conducted in this area have focused on the reef, and while the scientific literature suggests that reef ecological processes may be influenced by adjacent wetlands, an ecological characterisation of the lagoon has not been undertaken. This study characterises the ecosystems within the Bon Accord Lagoon and the hydrological and hydrodynamic processes that influence them. Bon Accord Lagoon receives land-based sources of pollution, including sewage. Although the lagoon is well-flushed ( $T_{50\%}=1.1$  days), the inorganic nutrient concentrations {N ( $4.0 \mu\text{M}$ ) and P ( $0.1 \mu\text{M}$ )} measured were comparable to polluted sites in Hawaii and Barbados. Tidal circulation is mainly responsible for instantaneous currents, transport and exchange in the lagoon, and there is a reasonably high rate of tidal exchange between the lagoon and Buccoo Reef. Red mangrove aboveground biomass measured  $14.1 \text{ kg} \pm 8.1 \text{ (dry wt.) m}^{-2}$  and mean litterfall rate was  $3.4 \text{ g} \pm 0.9 \text{ dry wt. m}^{-2} \text{ d}^{-1}$ . *Thalassia* standing crop varied between 2.9 t dry wt. in the wet season and 6.0 t in the dry season while mean annual productivity was  $4.2 \text{ g dry wt m}^{-2} \text{ d}^{-1}$ . Thirty-three fish species were recorded over the seagrass bed and 25 among the

mangroves. Reef associated invertebrates also use the lagoon as an alternative habitat. Bon Accord Lagoon supports mangrove, seagrass/algal and plankton communities, provides habitats for aquatic and terrestrial organisms, supports aquatic primary and secondary productivity, and provides organic matter to associated ecosystems. The lagoon could be functioning as an alternative habitat and nursery for reef-associated fauna. The extents of these relationships need quantifying if effective management strategies are to be formulated and implemented.

#### **KEYWORDS**

Bon Accord Lagoon, Buccoo Reef, hydrodynamics, mangrove, seagrass, zooplankton, productivity